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ABSTRACT

This review of the Northern California (NorCal) Cooperative Research Project on Student Attrition, which was conducted between 1968 and 1970, provides detailed information on how to use the findings of the study to identify those students who are most likely to drop out of college during their first term. Chapter I provides background information on the study, its major purposes, and the research design. Chapter II focuses on Phase 1 of the study, which attempted to describe the characteristics of first-time, full-time, day freshmen who discontinued their enrollment during the first semester or quarter. Chapter III reviews Phase 2 of the study, during which an instrument to identify the high dropout potential student was developed and validated. Chapter IV considers the experimental and quasi-experimental research conducted at individual colleges during Phase 3 to reduce student attrition. Chapter V explains how to weight the five factors which were revealed as predictive of student withdrawal during their first term of attendance: (1) sex correlated with aptitude test scores; (2) race; (3) educational goals; (4) parental encouragement of college attendance; and (5) importance of college to the student. This chapter explains that by adding the weighted values for these five variables potential dropouts can be identified. Chapter VI discusses how these weightings can be used. The survey instrument and a bibliography are appended. (HB)

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THE DIAGNOSTIC QUESTIONNAIRE WAS FAST AND ROUGH, BUT IT WAS ALSO GOOD ENOUGH:

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This is the second paper of a series of papers presented by Dr. Kester at the California Community and Junior College Association's Annual Conference for Research and Development Officers (CCJCA-R&D) which was held April 23-25, 1980 at Asilomar, California. This same paper was also presented at the Eleventh Annual Conference of the California Association for Institutional Research (CAIR), a conference for Institutional Research officers from California Colleges and Universities. The CAIR conference was held on February 25-26, 1981, in San Francisco.

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ABSTRACT

The Three-Year NorCal Attrition Study represents one of the more broadly-based attacks on the "revolving door" problem ever to be undertaken in the public community college, at least in California and possibly in the entire nation.

During Phase 3 of the Three-Year NorCal Attrition Study the research consortium included twenty-eight (28) California community colleges. In terms of students involved, each year for the three years, between 22,000 and 28,000 first-time, full-time day California community college freshmen took the NorCal questionnaire. In the northern region of California, more than one out of every two colleges participated, and more than one out of every two first-time, full-time freshmen participated. In terms of the entire state of California, one out of every three community colleges participated and more than one out of every seven first-time, full-time freshmen participated.

There presently exists more than 1,000 pages, scattered in journal articles, in dissertations and ERIC documents, that are directly related to the three-year NorCal Attrition Reduction Effort; and yet, incredible as it seems, nowhere in those 1,000 pages is there a clear, simplified description of how to score the salient response categories and thereby identify those students most likely to drop-out of college during their first term.

It is true that in the first NorCal related journal article, "NorCal; The Key is Cooperation" (Junior College Journal, 1970), partial correlations and beta weights were presented, but judging by the lack of research that one finds in the literature over the last ten years or more, one would have to conclude that these statistical gems have not readily or easily been used elsewhere. Certainly, the gems appear not to have been used by colleges outside the NorCal consortium.

It is hoped that this paper will help solve this problem. It will focus on the five most predictive categories and provide each response category's simplified weighting. Using this method, the scoring of the questionnaire is so simple it can be done by hand. One simple adds the simplified weights; if the total is plue ten (+10) or higher, the student is a "NorCal potential dropout".

Chapter 1: NorCal Review

Section 1 - What Was the Three-Year NorCal Attriton Study?

The Three-Year NorCal Attrition Study (1968-1970) represents one of the more broadly based attacks on the "revolving door" problem ever to be undertaken in the public community college, at least in California and possibly in the entire nation.

During Phase 3 of the Three-Year NorCal Attrition Study the research consortium included 28 California community colleges. In terms of students involved, each year for the three years, between 22,000 and 28,000 first-time, full-time, day California community college freshmen took the NorCal questionnaire. In the northern region of California, more than one out of every two colleges participated, and more than one out of every two first-time, full-time freshmen participated. In terms of the entire state and more than one out of every seven first-time freshmen participated.

Section 2 - How Did NorCal Begin?

The Northern California Cooperative Research Project on Student Attrition, or the NorCal Attrition Study, was a spin-off from a summer research institute sponsored by the California Junior College Association (CJCA) which met at the University of California at Berkeley in 1966. At that time a number of community college researchers received intensive training in the area of research design and the applications of computer technology to the analysis of Community College data.

Following that training, groups of Community Colleges began to share ideas through informal organizations in the Northern and Southern Regions of the state. As the Northern California group continued to develop, it became obvious that a number of the community colleges would be willing to cooperate in the development of a common research proposal. Specifically, Mr. Lee Stevens, at that time with the Foothill College District, proposed that a major project on student attrition be undertaken, with funding from each participating college to be used as matching money for federal grants.[1] In October 1967 at Cabrillo College, Aptos, twenty-two colleges reviewed Steven's proposal, and the idea for the NorCal Attrition Reduction Project was endorsed. Later, a multi-year funding committment was obtained and the idea was well on its way to becoming a reality.[2]

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[1] Dr. Lee Stevens is currently President of Golden West College in Huntington Beach, California

[2] A more complete history of the NorCal Consortium is provided in the ERIC paper ED 057 779. This document also contains an excellent introduction and review of the NorCal efforts to that date.

Section 3 - Why Was Attrition Chosen As the First Problem Area?

The magnitude of the attrition problem was such in the State of California that in 1970-71 the Coordinating Council for Higher Education (CCHE) for the State of California placed attrition at the top of the list of priority problems facing higher education in the state. Like the 1970-71 CCHE members, the members of the early 1967 NorCal Steering Committee believed the "revolving door" problem was one of the major problems facing community college education.

It is interesting to note that a similar rating of the importance of the student attrition problem came to light more than ten years after both CCHE and NorCal rated it number one.

Here is a quote from an article written by Isa Engleberg that appeared in the December/January 1981-82 issue of the "Community and Junior college Journal."[3] (Engleberg, Isa, 1981-82)

> "The November, 1980, issue of the Community and Junior College Journal published a survey conducted by the executive committee of the Presidents Academy of the American Association of Community and Junior Colleges that attempted to ascertain the most important interests and concerns of two-year college administrators. Of the 26 topics listed, the highest level of interest was shown on the subject of student retention."

To say the problem is a persistent and important one is to understate the obvious.

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[3]Engleberg, Isa N., "Whom Are We Trying to Retain?" The Community and Junior College Journal, December/January 1981-82, Pages 28-31.

Table 1, below, presents national data available at the point in time when NorCal targeted the "revolving door" problem as their first research concern. As the table shows, the "revolving door" problem certainly seemed, at that time, to exist nationally.[4] (ACT, 1959-66)

Table 1

The Year of Freshmen Enrollment is:

	Freshman Enrollment	Sophomore Enrollment	Number Withdrawing	Attrition Rate
1959	188,800	75,369	113,431	60.1%
1960	168,827	87,843	80,984	48.0%
1961	191,876	93,433	98,443	51.3%
1962	211,897	101,436	110,461	52.1%
1963	233,612	113,901	119,711	51.2%
1964	294,855	149,878	144,977	49.2%
1965	395,621	191,965	202,656	51.4%
1966	458,727	215,656	243,071	53.0%

Using these and similar individual college data, the NorCal steering committee chose attrition as the first problem area to investigate in an effort to at least partially overcome what appeared to be an attrition rate of between 48% - 60% between the freshman and sophomore years.

[4] American Council on Education "Profiles of College Freshman Enrollments," 1959-1966.

If an intensive and massive three-year study of attrition were to be undertaken cooperatively by twenty or more Northern California community colleges, then certainly the focus must be on what seemed to be a very detrimental form of attrition. An in-depth review of the literature, such as the ACE data shown in Table 1, and the consortium-level sharing of common experiences produced the consensus that heavy and early attrition was among the most detrimental. But how, exactly, would that special problem best be approached?

It was decided that the NorCal Consortium would concentrate on keeping the first-time, full-time students in college during the first risky semester or quarter of their attendance so that they would be more likely to "survive" for a longer period.

Section 4 - What Was the Research Design for the Three-Year NorCal Attrition Study?

A quote from Dorothy M. Knoell, of the California Postsecondary Commission,[5] is most appropriate:

> "...most studies of junior college students are descriptive (normative), correlational (predictive), or evaluative (only occasionally experimental)."[6] (Knoell, Dorothy, 1968)

[5]The California Postsecondary Commission has taken over the duties of the Coordinating Council for Higher Education.

[6]Knoell, Dorothy, "Junior College Student Characteristics." AAJC Newsletter, No. 21 (November 1968).

In order to attack the "revolving door" problem and prove that potential dropouts could be identified early and helped before they withdrew, it was necessary for the NorCal Attrition Study to be a study that included all of the above. Because the Three-Year NorCal Attrition Study would have to be descriptive, predictive, and experimental, it was divided into the following three phases--each of which took one year to complete:

1) Phase 1 (1968-1969): Descriptive Research

   Goal: Describe the characteristics of first-time, full-time, day freshmen who discontinue their enrollment during the first semester or quarter.

2) Phase 2 (1969-1970): Predictive Research

   Goal: Develop and validate an instrument that will identify first-time, full-time, day freshmen who have high dropout potential.

3) Phase 3 (1970-1971): Experimental

   Goal: Conduct experimental and quasi-experimental research designed studies at the individual colleges in an effort to overcome the "revolving door" problem and help potential dropouts.

It was clear that in order to reach potential dropouts, the institutions in the NorCal Consortium had to know who the potential dropouts were before they dropped-out. A diagnostic instrument was obviously needed. Furthermore, attrition had to be operationally defined so that a criterion would exist against which to validate questionnaire items that could be answered at the time the students enrolled. The following operational definition of attrition emerged: "A student was considered to be a dropout if he was a first-time, full-time (12 or more units) day student in the fall quarter or semester of the years mentioned above, and before the end of that initial quarter or semester, he had completely dropped all of his units." It was in this way that a very detrimental form of early attrition was attacked.

Chapter 2 - Phase 1 Findings

Dr. Thomas F. MacMillan was the project director for Phase 1 and Phase 2 of the Three-Phase Attrition Reduction Study. In 1970 the Community and Junior College Journal published Dr. MacMillan's article entitled "NORCAL: The Key is Cooperation." In that article, Dr. MacMillan presented the following findings from his University of California at Berkeley doctoral dissertation and from Phase 1.[7]

[7] MacMillan, Thomas F., "NORCAL: The Key is Cooperation." Junior College Journal, Volume 40, No. 8, (May 1970), pp. 28-31.

To illustrate the key variables in the "Attrition Prone" predictive model, he listed the variables shown in Table 2 below. As mentioned, the set of variables was derived in part from his doctoral research and in part from the NORCAL Phase 1 data "...with the combined set providing the most promising prediction of Attrition."[8]

The partial correlation of each key variable is also shown in Table 2. In every case, a positive weight was associated with attrition, while a negative weight was associated with persistence.

TABLE 2

KEY VARIABLES IN
NORCAL PREDICTIVE MODEL

Item	Responses	Weights
Sex/Ability.....	Hi male	.039
(.28)	Hi female	-.022
	Mid male	.022
	Mid female	-.107
	Low male	.211
	Low female	-.082
Importance of College to Me	N.R.	-.206
(.29)	High	-.043
	Low	.165
Race.....	Cau	.003
(.08)	Black	.040
	Oriental	-.091
Major.....	Undecided	.051
(.17)	Courses only	.024
	Terminal	.040
	Transfer	-.054
	Other	.022

[8]Ibid

To assess whether any association existed between institutional rank on attrition and other factors in the twenty-two colleges, Dr. MacMillan computed Spearman rank correlations. These correlations are shown below in Table 3.[9]

Table 3

SPEARMAN-RANK CORRELATIONS (RHO) OF SELECTED VARIABLES WITH ATTRITION

Ranked mean score--nineteen colleges--"Importance of College to Me"
Rho: .19 (n.s.)

Ranked mean score--nineteen colleges--"Parental Encouragement for College"
Rho: .24 ($p. < .10$)

Ranked scores-nineteen colleges--"Proportion of Students Declaring a Transfer Goal"
Rho: .42 ($p. < .001$)

Ranked scores--nineteen colleges--Assessed Valuation Per Unit of Average Daily Attendance
Rho: .06 (n.s.)

Ranked scores--nineteen colleges--Ratio of Sophomores to Freshman Enrolled
Rho: .32 ($p. < .10$)

Ranked scores--fourteen colleges--Faculty-Student Ratio
Rho: .54 ($p. < .05$)

Ranked scores--twelve colleges--Proportion of Adults with Four Years of College in the County Served by the College
Rho: .34 ($p. < .05$)

Ranked scores--twelve colleges--Proportion of Caucasians Enrolled (Racial Mix)
Rho: .33 ($p. < .05$)

[9] Ibid

In that article MacMillan further reported the finding that the community college having the highest attrition in the NorCal study also had the following characteristics: (a) The greatest racial mix, (b) the smallest proportion of students declaring a "transfer" goal, (c) the lowest mean scores for "Parental Encouragement" and "Importance of College to Me," and (d) the lowest proportion of sophomores enrolled.

Chapter 3 - Phase 2 Findings

During Phase 1, 28,000 California Community College students had completed a huge, three-page diagnostic questionnaire.[10] Of course much of the information that was gathered was not very predictive of students' attrition in their first term. Consequently, only those questionnaire items that had response categories that were associated with students' attrition were retained for use in Phases 2 and 3. This meant that the diagnostic questionnaire shrank from three legal size pages printed on both sides, to one letter size page.

Actually determining response category weightings were the order of business during Phase 2, the predictive phase of the study. It seems odd now, looking back with 20-20 hindsight, that at the end of Phase 2, no one published those response category weightings or otherwise put them into the public domain. This paper will correct that oversight.

The NorCal questionnaire items that emerged as successful did have a diagnostic capability of identifying potential dropouts before they in fact dropped-out. The five most powerful, predictive variables were: "Sex/Ability", "Race", "Goals", "Parental Encouragement", and "Importance of College to Self". Thus, as initially suspected, the students who were likely to pass through the "revolving door" were shown to have the following characteristics:[11]

1) "Sex/Ability": On the variable of "Sex/Ability", the potential dropout was most likely to be a low ability male, least likely to be a middle ability female.

2) "Race": On the variable of "Race", the potential dropout was most likely to be Black, least likely to be Oriental.

3) "Goals": On the variable of academic "Goals", the potential dropout was most likely to have lower educational goals than the persister.

4) "Penc": On the variable of "Parental Encouragement", the potential dropout was most likely to receive little parental encouragement for his college plans; and finally,

5) "Imps": On the variable of "Importance of College to Self", the potential dropout was most apt to have a low sense of the importance of college.

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[10] The Three-Page Phase 1 questionnaire is in the ERIC document ED 063 922.

[11] MacMillan, Thomas F., "NorCal Project: Phase 2 Final Report." 1970 ERIC ED 039 879.

It was clear from the first two years of the NorCal Attrition Study that the two best indicators of early potential withdrawal were the factors of:

1) "Sex/Ability," and

2) "Motivation"

In this shorter list, "Motivation" included the factors of "Goals," "Parental Encouragement" and "Importance of College to Self." Of these two factors, the "Motivation" factor was often shown to be at least as important, if not more important than the "Sex/Ability" factor. The "measure" of "importance" that is referred to here, of course, is the weightings of each factor in the equation. The exact weightings, of course, depends on each student's responses. For a given student it is quite possible that the subtotal for "motivation" would be more than the subtotal for "sex/ability."

Chapter 4 - Phase 3 Findings

As will be recalled, the third phase of the NorCal Consortium-Level Attrition Reduction effort was to be the experimental phase of the study. During this phase, participating community colleges were encouraged to use a "true experimental design" to see if their special efforts aimed at encouraging potential dropouts to remain in their colleges were successful or not.[12] The major findings of the third phase were in relation to the main question: "How successful were we in reducing the drop-out rate among those potential dropouts in our experimental group?"

In all, twelve colleges were able to use a "true experimental design" in which they randomly assigned potential dropouts to experimental and control groups. A listing of these colleges together with a brief description of their experimental condition is shown in Table 4.

[12] Campbell, Donald T., and Julian C. Stanley, Experimental and Quasi-Experimental Designs for Research on Teaching. Chicago, Illinois: Rand McNally, 1971

TABLE 4

Colleges That Used a True Experimental Research Design

College	Treatment Variables
American River College	Special Individual Counseling
Cabrillo College	Career Counseling
College of San Mateo	Learning Skills Course
Merritt College	Individual Counseling or a Special Course
Napa College	Special Individual Counseling
Ohlone College	Controlled Course Selection or Identification to Counselor
Porterville College	Special English Class or Group Counseling or Extra Individual Counseling
Reedley College	Recruitment, Pre-College Workshop, and Counseling
San Joaquin Delta College	Group Counseling
San Jose City College	Identification to Counselor and Intensive Individual Counseling or Intensive Counseling Without Identification
Shasta College	Identify to Counselor and Special Counseling
Sierra College	Identify to Counselor and Special Counseling

The findings of Phase 3 can be summarized as follows:

1. Eleven colleges that employed a successful true experimental research design reported differences between treatment and control groups in the number of students withdrawing during the first semester or quarter of attendance. All eleven colleges reported fewer student withdrawals among those students who were in the experimental group. Five of the colleges reported significance levels at the five percent level of confidence or greater; i.e., ($p < .05$). In general, across the entire eleven colleges, the attrition rate was cut approximately in half. That is to say that the attrition rate for the experimental group was about half what it was for the control group.

2. All eleven colleges that employed a successful experimental design reported differences between treatment and control groups in numbers of students reenrolling for a second term of college. All eleven colleges reported more students reenrolling among students who were in the experimental group. Six of the twelve reported significance levels at five percent level of confidence or greater; i.e., ($p < .05$).

3. Of the eleven colleges that employed a successful design, six reported differences in grade point average between experimental and control groups. All six reported higher grades among students in the treatment groups but only two reported differences significant at the five percent level of confidence; i.e., ($p < .05$).

4. All colleges that employed a successful treatment program included counseling in their procedures.

5. Most community colleges have within their present course structures and student personnel services the potential for significantly reducing attrition among first semester freshmen.

A more complete description of the Phase 3 findings can be found in a journal article[13] and in an ERIC Report.[14] (MacMillan, Thomas F., and Donald L. Kester, 1973) and (Kester, Donald L., 1971)

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[13] MacMillan, Thomas F., and Donald L. Kester, "Promises to Keep: NORCAL Impact on Student Attrition"; The Community and Junior College Journal, February 1973, Vol. 43, No. 5, pp 45 and 46.

[14] Kester, Donald L., "The Lesson of the Three-Year NORCAL Attrition Study: Many of the Potential Dropouts Can Be Helped. Phase 3, Final Report." July 1, 1971. (200 pages) ERIC ED 057 779.

Chapter 5 - Simplified Questionnaire Response Weightings

Section 1 - The Final Factors

In Appendix I of this paper is a rather dim copy of the one-page NORCAL diagnostic questionnaire that was used to identify potential dropouts in Phase 2 and Phase 3 of the study.[15] Unfortunately, a better copy is not possible since the originals were printed in purple ink.

Although the one-page questionnarie had twenty questions, there were only five factors that were really predictive of students' dropping-out in their first semester or quarter of attendence. These five factors are those that were listed toward the end of Chapter 2 of this paper. The factors were: (1) "Sex/Ability", (2) "Race", (3) "Goals", (4) "Parental Encouragement", and (5) "Importance of College to Self."[16]

As mentioned, only the weightings for the five factors were added to get a "Sum-A index" score for each student who completed the questionnaire. Thus the 20 item questionnaire provided the five factors plus responses to 15 more "nice-to-know" answers to 15 "extra" questions.

Four of the factors came directly from the questionnaire responses. The numbers of these four questions, as shown on the one-page questionnaire in Appendix I, are questions #3, #14, #18, and #19.

In addition, for students on whom both sex and aptitude test scores were available, a fifth weighting was added. This last factor was referred to in the literature as "Sex/Ability", which, if nothing else, actually managed to get people's attention.

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[15] The one-page questionnaire that was used in Phase 2 and Phase 3 is also shown in the ERIC document ED 057 771.

[16] Although the titles of these factors are slightly different from the "Key Variables", listed by MacMillan in his 1970 journal article, the differences are not very great. The response categories, too, are slightly different. But, the similarities are more striking; and serve to point out that the weightings derived for the five factors of Phase 2 owe much to the earlier Phase 1 efforts of Dr. MacMillan and the consortium members.

Section 2 - The Final Weightings

A student's "Sum-1 index" score, of course, depended on how the student answered the questionnaire. Here is how each response category for each of the five factors was weighted.

(1) "Sex/Ability"

Data on this factor were gathered from responses to question #4 on the one-page questionnaire plus the student's aptitude test score. At first the scoring key included only the ACT-C, SCAT-H, SCAT-L, COOP, and SAT-V tests; as is shown below:

Table 5

WEIGHTINGS FOR SEX/ABILITY

	LOW	MIDDLE	HIGH
ACT - C	0 - 12	13 - 20	21 +
SCAT - H	0 - 281	282 - 295	296 +
SCAT - L	0 - 41	42 - 60	61 +
COOP	0 - 153	154 - 167	168 +
SAT - V	0 - 400	401 - 570	571 +

INTERACTED WITH SEX TO GIVE THESE WEIGHTINGS

	LOW	MIDDLE	HIGH
MALE	21.1	2.2	3.9
FEMALE	- 8.2	-10.7	-2.2

Later, however, a rough conversion for other aptitude tests was made. That conversion is shown below.

Other Appropriate Aptitude Test

Sex	Test Score	Weighting
Male	75th percentile and over	+ 3.9
Male	32-74th percentile	+ 2.2
Male	Below 32nd percentile	+ 21.1
Female	75th percentile and over	- 2.2
Female	32-74th percentile	- 10.7
Female	Below 32nd percentile	- 8.2

(2) "Race"

Data on this factor were gathered from responses to Question #3 on the one-page questionnaire. Response categories were weighted as shown below.

Question: "What is your race?"

Race	Weighting
Caucasian	+ .3
Caucasian (Spanish surname)	+ .3
Black	+ 4.0
Oriental	- 9.1

(3) "Goals"

Data on this factor were gathered from Question #14 on the one page questionnaire. Response categories were weighted as shown below.

Question: "What is your reason for coming to college?"

Response:	Weighting
"I haven't really decided yet"	+ 5.1
"Just to take interesting courses"	+ 2.2
"To complete one of the technical vocational courses"	+ 3.4
"To get a junior college degree only"	+ 4.0
"To get a junior college degree and complete a vocational/technical program"	+ 4.0
"To prepare for transfer to another institution with or without an AA degree	- 5.4

(4) "Parental Encouragement"

Data on this factor were gathered from Question #18 on the one-page questionnaire. Response categories were weighted as shown below.

Question: "How important is it to the following people that you go to college?"

	Level of Importance			
Parent	Not very important	Somewhat important	Quite important	Very important
Father	+ 3.1	+ 3.1	- 3.7	- 3.7
Mother	+ 3.1	+ 3.1	- 3.7	- 3.7

(5) "Importance of College to Self"

Data on this factor were gathered from Question #19 on the One-Page questionnaire. Response categories were weighted as shown below.

Question: "How important is college to you personally?"

Level of Importance	Weighting
"not very important"	+ 16.5
"somewhat important"	+ 16.5
"quite important"	+ 3.7
"extremely important"	+ 3.7

Section 3 - Interpreting the Total "Sum-1 Index" Score

As mentioned at the beginning of Section 2 of this chapter, a student's "Sum-1 Index" score was simply the sum of the weightings of his four or five response categories. "So you add up all the weightings to get a total, what did the total mean?", and "How was it used?".

These questions go to the heart of the validity question, and validity was a problem at the beginning of Phase 3. Without going too far into detail in this chapter, suffice to say here that the operational definition of a potential dropout that was shown by the current writer, during Phase 3 and in later validation studies to be satisfactory was, "A student is a potential dropout if his or her total sum-1 index score is +10 or higher."[17]

So, one simply adds the weightings for the four or five factors to get a given student's "sum-1 index" score. If that score is +10 or higher (up to +45); then, by definition, that student is a "potential dropout." As has been shown in this paper and elsewhere: (1) those students who had such "sum-1 index" scores did, in fact, dropout at a high rate; i.e., the definition proved to be valid, and (2) those colleges that conducted a "true experimental design" in Phase 3 were able, generally, to cut their drop-out rate in half for students in experimental groups. So this definition proved to be valid and effective in that it led to much higher rates of retention for these high-risk students.

Chapter 6 - What Does the Future Hold?

With the placement of this paper in the public domain, the weightings will be available to anyone who is interested in what the weightings were. It is certainly possible, even probable, that these same weightings could prove helpful to an investigator who wished to repeat Phase 3 of the NorCal study on his campus. All he would have to do is ask the same questions, provide the same response categories, and score each questionnaire as described in this paper.

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[17] At the beginning of Phase 3 a validation study was conducted. The results of that study are given in the document, by the present author, entitled "Further Validation of the NorCal Questionnaire: Secondary Validation." In ERIC ED 062 965 (21 pages)

A number of NorCal colleges were assisted in conducting a validation study during Phase 3. The results of those validation studies are given again by the present author, in the document "The Lesson From the Three-Year NorCal Attrition Study: Many of the Potential Dropouts can be helped. Phase 3, Final Report." In ERIC ED 057 779 (200 pages)

In addition, the long term validity of the questionnaire to identify potential dropouts was shown in the current writer's dissertation which followed 390 potential dropouts for two years. That document is entitled "Theoretical and Practical Parameters of "Two-Year Impact on Potential Dropouts," copyrighted doctoral dissertation , University of California, Berkeley, 1973, (287 pages)

Given that student attrition was identified in 1970 and 1980 as a major problem, the provision in this paper of the "scoring key" and blueprint for replicating the third phase of the NorCal study should prove helpful. But, the author would like to suggest a further refinement. While one could use the questionnaire and scoring key "off the shelf" to identify potential dropouts--who he would then assign to experimental or control groups--one could "build one's own predictive equation."

Ideally, an institutional research officer at each college should build a predictive equation for his college students in the way that the NorCal consortium did during Phase 1 and Phase 2. In this ideal world, the researcher could "throw the NorCal questions into the number cruncher" to see if they were the best predictors on his campus and, if so, what their precise weightings were.

Unfortunately, the real world is far from ideal. While the above description accurately reflects what could happen in the best of worlds, it seems to rarely occur. Until such time as individual, college-specific predictive equations have been generated and used, most researchers will be left with what others have done and made available. The weightings and procedures described herein are one resource that can be easily used. The writer stands ready to assist, from distance, anyone who wishes, somehow, to implement an attrition reduction study similar to that of NorCal.

Anyone, who wishes to do so, may contact the author at the following address:

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NORCAL CO-OPERATIVE RESEARCH PROJECT

APPENDIX I

1. NAME _____ (LAST NAME / FIRST NAME / MIDDLE INITIAL)

COLLEGE USE - DO NOT MARK THIS AREA

TEST USED: ACT | SAT | CO-OP | SCAT | OTHER

2. SOCIAL SECURITY NUMBER

3. WHAT IS YOUR RACE? — CAUCASIAN | CAUCASIAN (SPANISH SUR NAME) | BLACK | ORIENTAL | OTHER

4. SEX — MALE | FEMALE

5. WHAT IS YOUR MARITAL STATUS? — SINGLE | MARRIED | DIVORCED OR SEPARATED

6. IF EMPLOYED WILL YOU KEEP YOUR JOB WHILE IN COLLEGE? — YES | NO | NOT EMPLOYED

7. IS YOUR JOB RELATED TO YOUR COLLEGE MAJOR? — YES | NO | NOT EMPLOYED

8. WILL YOU NEED FINANCIAL AID TO REMAIN IN COLLEGE? — YES | NO

9. IN THE HOME WHERE YOU GREW UP WHICH OF THE FOLLOWING BEST DESCRIBES THE JOB OF THE HEAD OF THE FAMILY? — UNEMPLOYED | UNSKILLED (NO FORMAL TRAINING) | SEMI-SKILLED (SOME FORMAL TRAINING PREFERRED) | SKILLED (SOME FORMAL TRAINING REQUIRED) | MANAGERIAL (CONSIDERABLE TRAINING REQUIRED) | PROFESSIONAL

10. DOES YOUR MOTHER HAVE A JOB OUTSIDE THE HOME? — YES, FULL TIME | YES, PART TIME | NO

11. HOW FAR AWAY FROM COLLEGE DO YOU LIVE? — 1-5 MILES | 6-10 MILES | 11-15 MILES | 16-20 MILES | OVER 20 MILES

12. HOW DO YOU GET TO THE CAMPUS? — OWN CAR | CAR POOL | PUBLIC TRANS. | SCHOOL BUS | OTHER

13. HOW LONG DOES IT TAKE YOU TO GET TO CAMPUS? — 10 MIN. OR LESS | 10-30 MINUTES | 30-45 MINUTES | 45-90 MINUTES | OVER 90 MINUTES

14. WHAT IS YOUR REASON FOR COMING TO COLLEGE? (MARK ONE CHOICE ONLY)

- I HAVEN'T REALLY DECIDED YET
- JUST TO TAKE INTERESTING COURSES
- TO COMPLETE ONE OF THE TECHNICAL/VOCATIONAL COURSES
- TO GET A JUNIOR COLLEGE DEGREE ONLY
- TO GET A JUNIOR COLLEGE DEGREE AND COMPLETE A VOCATIONAL/TECHNICAL PROGRAM
- TO PREPARE FOR TRANSFER TO ANOTHER INSTITUTION WITH OR WITHOUT AN A.A. DEGREE

15. SOMETIMES PEOPLE ARE UNABLE TO COMPLETE COLLEGE EVEN THOUGH THEY PLAN TO. IF YOU ARE UNABLE TO FINISH WHAT DO YOU THINK WILL BE THE LIKELIEST OBSTACLE? — ACADEMIC | FINANCIAL | MARRIAGE | MOTIVATION | OTHER

16. WE SOMETIMES TURN TO OTHERS FOR ADVICE WHEN WE ARE MAKING PLANS. IF YOU WERE MAKING AN IMPORTANT DECISION NOW HOW LIKELY IS IT THAT YOU WOULD TURN TO EACH OF THE FOLLOWING:

	NOT VERY LIKELY	MAYBE	LIKELY	VERY LIKELY		NOT VERY LIKELY	MAYBE	LIKELY	VERY LIKELY
NO ONE					COUNSELOR				
FATHER					BROTHER/SISTER				
MOTHER					FRIENDS				
TEACHER					OTHER				

17. WHICH OF THE FOLLOWING PEOPLE WOULD YOU RELY ON MOST FOR ADVICE ABOUT SCHOOL OR JOB PLANS? — NO ONE | FATHER | MOTHER | TEACHER | COUNSELOR | BROTHER/SISTER | FRIENDS | OTHER

18. HOW IMPORTANT IS IT TO THE FOLLOWING PEOPLE THAT YOU GO TO COLLEGE?

	NOT VERY IMPT.	SOMEWHAT IMPT.	QUITE IMPT.	EXTREMELY IMPT.
FATHER				
MOTHER				
OTHER				

19. HOW IMPORTANT IS COLLEGE TO YOU PERSONALLY? — NOT VERY IMPT. | SOMEWHAT IMPT. | QUITE IMPT. | EXTREMELY IMPT.

20. WHAT IS YOUR MAJOR?

(USE THE LIST OF MAJOR CODES ON THE REVERSE SIDE OF THIS PAGE)

NORCAL CO-OPERATIVE RESEARCH PROJECT

INSTRUCTIONS

This questionnaire is being given to entering freshman students in 22 colleges throughout Northern California as part of a cooperative research project which has been in progress for one year. The questions on the reverse side of this page should take no more than five or six minutes of your time. Please answer every question to the best of your knowledge. If you do not wish to answer a question, skip it and go on to the next one.

We appreciate your help. The results of this study will be used to develop new programs on your campus, and we hope to provide as much information to each college as possible from your responses.

Thank you for taking this extra few minutes of your time.

Directions for Answering Questions

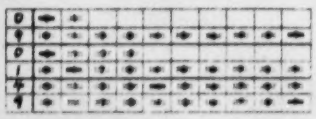
Please make heavy marks to indicate your responses to the questions on the reverse side of this page. Read each question carefully, and make the appropriate responses in each case: some questions may ask for more than one response.

For marking social security number and college major code, use the form illustrated below. List the numbers down the page, and then mark the spaces corresponding to the numbers. For example, if we were asking for your birth date, the response would be:

DATE OF BIRTH

SHOW MONTH DAY. YEAR IN NUMBERS (ALWAYS PRECEDE UNIT NUMBERS WITH ZERO AS 01, 02, 08, ETC.)

EXAMPLE: SEPT 1, 1949 WOULD BE WRITTEN AS FOLLOWS. 09 01 49 AND MARKED AS SHOWN



MAJOR CODES FOR QUESTION 20

ADVERTISING	202	HOME ECON	560	BLDG TECH	808	MARKETING	211	PRE DENTIST	682	PHILOSOPHY	570
ACCOUNTING	201	HORT APPR	915	GEN BUS	204	MATHEMATICS	620	DIESEL MECH	814	PHYS ED	420
AGRI-BUS	102	IND ARTS ED	899	BUS AD	205	MEASRMT SCI	305	DSL MECH APP	910	PHYS SCI	630
AERONAUTICS	801	IND DRFTSMN	823	BUS ED	206	MT CUT APPR	919	DRAFTING	815	PLASTERER AP	923
AEROSPACE	802	IND LAB TECH	824	CARPENTRY	809	MECH TECH	850	DRYWALL CON	911	PLMBG APP	924
AIR-APP	901	IND PHOTO	825	CRPTRY APPR	907	MED ASST SEC	212	EARTH SCI	640	POLICE SCI	888
AIR CONDIT	803	IND SPVSR	826	CERT LAB ASST	455	MED RECPTNST	224	ECONOMICS	720	PSYCHOLOGY	750
ALLD HEALTH	459	IND TECHGST	827	CHEM TECH	692	MED REC TECH	462	PRE ED	590	PSYTC ASST	466
ANTHRO	710	INHLTN THRPY	461	CHILD DVLPMT	561	MED SECTY	213	ELECTRICIAN	816	PUBLIC AD	217
APPL REPAIR	804	INSURANCE	209	CLERICAL	203	MED TECH	455	ELCTRICN APP	912	PUBLIC SERV	218
PRE-ARCH	681	IRON WKRS AP	916	COMM PHOTO	521	PRE MED	684	ELTRNCS TECH	817	RADIO TV	542
ARCH DRAFT	802			COMM PILOT	810	MIL CONT MKR	831	ENGINEERING	301	RADIOLOGIC T	467
		JOURNALISM	535			MIL CONT MKR	930				
ART	520	LANG FRENCH	552	CMPTR PROGNG	215	MUSIC	580	ENGR TECH	304	REAL ESTATE	219
ASTRONOMY	631	LANG GERMAN	553	CMPTR TECH	811	NRSG AA DEG	452	ENGR TECH AP	913	RECEPTIONIST	220
AUTO MECH	805	LANG RUSSIAN	554	COOKING APPR	908	PRE NRSG	451	ENGLISH	530	RECML LDRSP	430
AUTO MECH-AP	902	LANG SPANISH	551	COSMETOLOGY	881	OFFICE AD	214	FIRE SCIENCE	883	RECML TECH	481
AVIONICS	806	LATHERS APPR	917	COURT REPORT	207	OFF EQMT TEC	215	FLUID PWR T	819	REPROGRPHICS	833
BARBER APPR	903	PRE LAW	786	CRIMINOLOGY	770	OFF MACH	216	FD SER VPVSR	820	ROOFING APPR	925
BIOL SCI	610	LEGAL SEC SP	210	CULNRY ARTS	813	OPR ENGR APP	921	FOOD SER	821	SECRETARIAL	221
BDY-FNDR APP	904	LIB ARTS TR	510	CULNRY WKRS	909	OPHTHLC ASST	464	FORESTRY-PRE	883	SHT MTL WKR	834
BDY FNDR REP	807	LIB ARTS TER	515	DATA PROCESS	208	OPTMC ASSTG	465	GEOGRAPHY	780	SHT MTL APP	926
BOTANY	611	MACH APPR	918	DENTAL ASST	454	PRE OPTMTRY	685	GLAZIER APP	914	SOCIOLOGY	760
BRICK LYRS AP	906	MACH WDWKG	828	DENTAL HYGNST	488	PAINTING APP	922	GRAPHICS	822	SPEECH	548
BROADCASTING	541	MACHINIST	829	DENTAL TECH	460	PRE PHRMCY	688	HEALTH & SFTY	410		
								HIST POL SCI	740		

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